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AUTHOR Fisher, Robert E.
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ABSTRACT

Diction in choral music simultaneously functions as a vehicle for both the musical medium and the textual message. Nearly every choral methods and choral conducting book written in this century includes some references to and instructions for the practice of choral diction. Most of these methods, however, are not based on any sort of systematic inquiry, but rather on personal preference and other types of subjective judgments. Many of the unconscious, habitual physical shifts that occur in the production of fluent speech often transfer into song. These practices can confound both choral tone and text intelligibility. Most choral diction methods do not train singers to eliminate these perturbing speech habits in choral singing. Furthermore, choral diction methods are non-standard and plagued with inconsistency. The purpose of this study is (a) to establish a rationale for the development of systematic approaches in English diction methods, and (b) to outline a set of "principles" from which such a systematic choral diction method can and should be developed. The rationale and set of principles have been assembled from and supported by research in the areas of speech, linguistics, psycholinguistics, hearing, singing, acoustics, and psychoacoustics. (Author)

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A Rationale and Set of Principles for the Development of a Systematic Approach to English Diction in Choral Performance

By Robert E. Fisher, West Virginia University

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A Rationale and Set of Principles for the Development of a Systematic Approach to English Diction in Choral Performance

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Abstract

Diction in choral music simultaneously functions as a vehicle for both the musical medium and the textual message. Nearly every choral methods and choral conducting book written in this century includes some references to and instructions for the practice of choral diction. Most of these methods, however, are not based on any sort of systematic inquiry, but rather on personal preferences and other types of subjective judgements.

Many of the unconscious, habitual physical shifts that occur in the production of fluent speech often transfer into song. These practices can confound both choral tone and text intelligibility. Most choral diction methods do not train singers to eliminate these perturbing speech habits in choral singing. Furthermore, choral diction methods are non-standard and plagued with inconsistency.

The purpose of this study is a) to establish a rationale for the development of systematic approaches in English diction methods, and b) to outline a set of "principles" from which such a systematic choral diction method can and should be developed. The rationale and set of principles have been assembled from and supported by research in the areas of speech, linguistics, psycholinguistics, hearing, singing, acoustics and psychoacoustics.

Approaches to choral diction are often based on highly subjective judgements such as preference or opinion. Such methods rarely address the numerous unconscious and habitual speech habits that transfer into sung speech and confound choral tone and text intelligibility. The purpose of this paper is to establish a rationale for a systematic approach to the development of English diction methods in choral singing. Furthermore, a set of principles has been outlined from which such a systematic choral diction method can and should be developed. The rationale and principles have been assembled from research in speech and hearing, acoustics and psychoacoustics, linguistics and psycholinguistics and singing. These principles are appropriate for choral methods employed at the secondary school level and beyond.

Introduction

Diction in choral music simultaneously functions as a vehicle for both the musical medium and the textual message. Choral tone (i.e., the general timbre of the combined voices) is highly dependent on the manner in which the phonetic elements of the language are produced by the singers. Timbre shifts occur in choral performance because of the phonetic shifts which naturally occur in language. Blend, balance, and intonation of the choral ensemble are affected by phonological similarities and dissimilarities among singers at any given moment in choral performance, and through time as the language flows through one speech sound to another. Likewise, the intelligibility of the text depends greatly upon the manner in which the sounds of the language are presented by the singer and the sung speech sounds are perceived by the listener.

To assume, however, that the blends of speech sounds used in the production and perception of fluent speech are appropriate for the production of good choral tone and the intelligibility of the sung text in choral singing is faulty. Many of the unconscious and habitual physical shifts that occur in the production of fluent speech often transfer to the "elongated speech" of song. These practices can have undesirable effects on both choral tone and text intelligibility. Understanding the phonological, acoustical, and physiological phenomena related to speech that can adversely effect intelligibility or tonal production of sung language should be fundamental to the development of an effective choral diction methodology. Likewise, consideration must be given to the variables imposed by the parameters of music upon sung language that may interfere with the perception of phonemic, semantic, or syntactic information. Most existing choral diction methods do not rely upon scientific or empirical research or a review of literature in related fields such as speech, linguistics, and acoustics. Subjective judgements often lie at the core of choral diction practices. Differing approaches may fall victim to criticism or debate based upon little more than personal preference. Moreover, choral diction practices remain non-standard and are plagued with inconsistency.*

*(Numerous sources on choral and vocal techniques have provided the body of information for statements made in this paper regarding current practice in choral diction and preferences in choral tone. These texts, many of which are well know in the field of choral music, are not referred to specifically in the text due to lack of space. Many are included, however, in the list of references.)

Rationale for the Development of a Systematic Method for English Diction in Choral Performance

The Production of Language Speech and Song

When a basic speech sound (phoneme) is produced in isolation (i.e., outside the structure of a word or sentence), the speech articulators can fully assume the physical positioning, or "articulatory target," for that speech sound. This can be seen on a spectrograph where the formant bands of phonetically pure vowel sounds produced in isolation, for example, are ostensibly stable constant. This indicates that the vowel sound has been unchanged acoustically from its outset to its conclusion. In contrast, the sounds produced in fluent speech are constantly in transition. In fact, the articulators often only approximate the articulatory target while moving through a series of postures to and from each new speech sound.

This process of adaptation to adjacent sounds in fluent speech is called "coarticulation" (Wilder, 1975). The result of coarticulation is that each successive speech sound influences, and is influenced by, adjacent speech sounds (Daniloff and Hammarberg, 1973). Numerous studies point to coarticulation as being a natural process that is of primary importance to the production of spoken language (Bronstein,1960;) Chomsky and Halle, 1968; Danniloff and Hammarberg, 1973;Eisenson, Auer, and Irwin, 1963; Gleason, 1961; Kaisse, 1985; Malecot, 1960; Sloat, Taylor and Hoard, 1978; Wilder, 1975). In choral singing where tempos often fall far below those of fluent speech, however, coarticulation can hinder choral tone and textual intelligibility.

Coarticulation and Vowel Production

When **diphthongs** occur in fluent speech, the initial vowel sound is generally followed by and almost immediate motion toward the secondary vowel sound. This coarticulation results in a complex vowel that is constantly changing. The precise phonetic identities of the two diphthong components are compromised. The resulting blend is efficient in connected language. In choral singing, however, the habitual practice of beginning the diphthong transition too soon and too gradually can seriously hamper choral blend, thereby disrupting ensemble precision and unity, and lowering aesthetic appeal.

Vowel alteration occurs in certain phonemic environments such as "ag" [ag], "ang" [aŋ] "ing" [Iŋ], "eg" [ɛg], and "eng" [ɛŋ], when the speaker moves from the vowel to the consonant articulator position located at the back of the tongue and mouth. In singing, the early onset and prolongation of this transition often results in the production of a secondary vowel sound creating a "pseudo-diphthong," thereby introducing many of the same challenges as those accompanying the performance of real diphthongs. In the word, "beg," for example, the "e" [ɛ] vowel is commonly produced with the back of the tongue raising in anticipation of the final "g" sound. The resulting vowel sound approximates the diphthong heard in the word "day." Vowel alteration and "pseudo-diphthong" production also occur in the phonemic environments "el" [ɛl] and "il" [Il], when the raised middle of the tongue, placed thus for the vowel, lowers as the blade of the tongue raises toward the top front of the mouth. the result is a secondary vowel sound approximating a schwa. In choral singing, the gradual transitions associated with elongated "pseudo-diphthongs" can interfere with choral blend, once again disrupting ensemble unity and thereby lowering aesthetic appeal.

Nasalization of a vowel occurs when the velum (i.e., the soft palate located at the back roof of the mouth) is partially lowered in anticipation of, or transition from, a nasal consonant (i.e., m,n,ng). This movement of the velum that habitually occurs in such environments is an unconscious economizing habit in speech (Ali, Gallagher, Goldstein, and Daniloff, 1971). When transferred to singing, this tendency can result in an overly nasalized tone quality that is generally considered undesirable in choral performance.

Coarticulation and Consonant Production

Consonant assimilation occurs in speech at word junctures (i.e., the point at which two words join in a phrase or sentence) where the first word in a pair ends with a consonant, and the second word begins with a consonant. At such a consonant/consonant (C/C) juncture, coarticulation can cause a modification in one or two of the consonant sounds (Abercrombie, 1967; Carrell and Tiffany, 1960' Gimson, 1970; Gleason, 1961). Two common types of assimilation that occur at word junctures are the "homorganic consonant assimilation" and the "juxtapositional assimilation."

Homorganic consonant assimilation occurs at C/C word junctures where the abutting consonants are each formed in the same or similar place by the articulators (e.g., b-p,g-k,d-t,t-th). This type of assimilation is characterized by the "accommodation" of the articulation of the last consonant of the first word into the articulation of the first consonant of the second word of the pair. In other words, the first of the two consonants is not released, but its closure is simply "absorbed" into the second consonant (Bronstein, 1960; Carrell and Tiffany, 1960; Gimson, 1970). Some word pairs conducive to the formation of this type of assimilation include: "hope before," "that they," "hath they," "had thought," "bag caught," and "track guard."

A **juxtapositional assimilation** is the creation of a single consonant sound from two different adjacent consonant sounds. It is formed by the rapid transition from the outset of the first to the completion of the second speech sound. Word combinations such as "did you," (heard as [didʊu]), "and he" (heard as [aentI]), and "is she" (heard as I[ʃi] are likely to result in juxtapositional assimilations at the word juncture (Abercrombie, 1967).

While consonant assimilation is common and generally acceptable in fluent speech, it is a questionable practice in choral singing which is often performed at tempos that do not require economization of articulator movement. Where the complete articulation of consonants is possible, the distortion or elimination of such articulation is not defendable from either a phonological or physiological standpoint in singing. Generally speaking, the more phonemic information that is lost during language production in speech and song, the greater the loss in intelligibility of the text.

Other Fast Speech Production Rules

Kaisse (1985) identifies other fast speech rules which have been found to be present in spoken language. These include (a) **vowel reduction** where an unstressed vowel spoken rapidly approaches a schwa [a] sound, (b) **schwa deletion** in which words beginning with unstressed schwa vowels are pronounced without the initial schwa sound (e.g. 'merica), (c) **consonant reduction** where the articulation of a final stop consonant in an word is incomplete, and (d) **consonant elision**, where a consonant may be dropped altogether. Obviously, these fast speech habits can transfer into singing and interfere with both text intelligibility and choral tone.

Production of Prosody in Speech

In addition to the alterations, reduction and eliminations of speech sounds that occur in fluent speech, the **prosodic features** of speech, such as tempo, rhythm, and intonation are integrated into spoken language by the speaker to communicate affective meaning, emphasize words and ideas for better understanding, and to generally provide structure to phrases and sentences. The utilization of prosody in spoken language is often unconscious and habitual. In song, the musical parameters of rhythm, tempo, pitch, and accent will generally supersede or replace many of the possible spoken prosodic features. Once language is governed by these musical structures, the singer is no longer free to apply natural language prosody. Words and ideas cannot be enhanced at will by the singer to convey added meaning. The effective communication of the message relies on the will of the musical medium.

The Perception of Language in Speech and Song

Research in the perception of language in speech and song focuses on two main areas: 1) discrete speech sounds, and 2) connected speech sounds (fluent language production). Both types of research have application to the development of a choral diction method since both types of speech phenomena occur in choral performance.

Perception of Discrete Speech Sounds

The perception of vowel sounds in isolation is not phonemically or acoustically consistent from one individual to another.

Through his research, Appleman (1967) found several allophonic (i.e., actual vowel sounds) variations in the production of vowels from individual phonetic symbols. In other words, even though the subjects were instructed to produce certain pure vowel sounds, the vowels were perceived by other subjects as varying throughout an often wide range of different discrete vowel phonemes.

In another study, Stumpf (1926) asked subjects to identify the vowels being sung at various pitch levels by different individuals. The vowels in the upper female vocal range were identified with only 50% accuracy, but accuracy rose significantly when the vowel was preceded by a plosive consonant. In a review of the study, Sundberg (1982) concluded that perceptual sharpening occurred due to the transition of the consonant to the vowel, because "changing stimuli are more easy to process than quasi-stationary stimuli" (p.67).

Howie and Delattre (1962) concluded that all vowels heard performed by female singers at the highest pitches are perceived as the phoneme /ɑ/ ("ah"). Studies conducted by Smith and scott (1980) and di Carlo (1972) revealed that different vowels sung on the same pitch varied in intelligibility. Furthermore, simple vowels are evidently more difficult to identify accurately than are diphthongs (Nelson and Tiffany, 1968).

These studies indicate that simple vowel sounds alone are inadequate phonetic identification in both male and female voices. More acoustic information is required by the listener. Stumpf's research suggests that the additional aid required must come from an associated consonant sound. This is supported by Smith and Scott (1980) who found that the identification of vowels in singers was more accurate when attached to consonants than when sung in isolation. In other words, intelligibility of sung text increases when both vowels and consonants are produced by the singer and perceived by the listener.

From an investigation into "Perceptual Images, Processing Time, and Perceptual Units in Speech Perception" (1975), Massaro concluded that the vowel (V), the consonant-vowel (C-V) and the vowel-consonant (V-C) syllables function as the perceptual units of information in speech, but that the C-V and V-C units were the most accurately perceived speech sounds.

Several studies have been conducted to investigate the acoustical relationship between adjacent consonants and vowels. Winitz, Scheib, and Reeds (1972) recorded various consonant-vowel (C-V) phonemes which began with the plosives /p,t,k/. After the vowel phonation had been spliced from the tape, leaving only the burst portions of the consonants, subjects were able to identify the vowel that had originally followed the consonant. A study carried out by Ali and Daniloff (1974) investigated the ability of subjects to identify emphatic consonants that had originally been spoken before a vowel. Using the acoustic information from the vowel alone, subjects were able to identify the consonant that had preceded the vowel.

To study the effects of mixing coarticulated cues from fluent speech, Schatz (1954) recorded the words "keep," "cop," and "coop." He then excised the first twenty milliseconds (ms) of the /k/ burst from each example and spliced it onto the beginnings of the recorded words "heap," "hop," and "hoop," respectively, from which he had removed about 50 ms of the beginning /h/ aspiration. In listening to the newly created phonemes, subjects had no difficulty in identifying the beginning /k/ consonants. When the same consonant portions were attached to vowels other than those with which they had originally been spoken, however, the difficulty of consonant recognition grew significantly.

The various studies on the perception of speech sound units described above indicate that 1) a consonant must be articulated if vowel identity is to be maximized, and 2) vowel and consonant identify are critical factors in text intelligibility. When language is placed into song it is very important, therefore that the singer strive for phonetic accuracy and purity of vowels along with the clear and complete articulation of adjunct consonants. This suggests further that while consonant assimilation, reduction, and elision are acceptable in the phonology of spoken English, the same is not true for sung language. Different phonological rules must apply to the production of language in song so the intelligibility can be maximized.

Perception of Connected Speech Sounds

Beyond the basic phonetic information of language as important aids to intelligibility, several other component of connected language have been found to serve as important operant in the perceptual process. According to Dew and Jensen (1977), the human ability to organize language by sounds points to the existence of some sort of centralized neural phonetic control. This neural processing, which is apparently the same whether the language is spoken or sung (Sundberg, 1982), depends upon various cues which enable the listener to organize and normalize the speech sounds into intelligible communication. The presence of these cues is critical to language comprehension.

Oakeshott-Taylor (1980) identifies the cues which aid in the perception of fluent speech as including 1) understanding of the semantic and syntactic rules of the language, 2) learned vocabulary and aroused expectations based upon the purpose and subject of the communication (i.e., an established context), and 3) the prosodic information received in the signal.

Syntax and Semantics

Chomsky (1971), Jackendoff (1972) and Katz (1972) all hold to the theory that all sentences have a surface structure that is represented by the organization of words in the sentence, along with a deep structure, or the underlying meaning of the sentence resulting from the actual words utilized. In addition to these two basic components of language, the phonology of spoken language provides additional meaningful information for understanding (Chomsky, 1971; Solberg, 1975). Simply stated, one understands a sentence because the syntax provides a basic phrase organization into which meaningful word units are inserted and subsequently spoken with a familiar phonology (Solberg, 1975, p. 333).

It must be noted, however that deviations from normal syntactic structure often occur in poetry and song. Such deviations can introduce challenges to textual intelligibility. Sung language is also subject to musical parameters which often cause deformity in word production. These phoneme and word production "abnormalities" may tend to cloud the words and syntactical organization. Finally, even if the semantic and syntactic structures remain intact in sung text, musical syntax can cause unusual rhythmns and breaks between words that might lower intelligibility. This leaves phonology with an increased importance in the production and perception of sung language.

Context

While word and sentence intelligibility are dependent upon semantics and syntax, these structural components, even when accurately perceived are inadequate by themselves for the apprehension of fluent speech. Sentence context is also an important influence in language recognition. One function of context is the reduction of alternative word possibilities. For example, if a word in a sentence has been omitted or is not understood, context cues will often enable the listener to insert the correct missing word. One reason for this is that the number of possible word choices has been reduced.

> ...the listener is more likely to recognize the missing word in the sentence Pears grow on ----, not bushes. when the word is spoken in context than when the word is heard in isolation. The preceding context reduces the number of alternatives for the missing word (Freund, 1975).

In studies where the first word of a phrase was excised and one, two, and three of the remaining words were heard, Pickett and Pollack (1963) found that the missing word was replaced more accurately as more subsequent words were added. This suggests that more words understood correctly in choral singing may also result in other less attainable words being understood as well.

Prosodic Information

The prosodic features of language include such parameters as pitch (or intonation) contour, pattern of segmental durations (rhythm), and intensity contours. They are used by a speaker to distinguish between stressed and unstressed syllables, to define syntactic units, to indicate contrasting emphasis, and to establish a signal for an attitude or psychological state (Klatt, 1980; Lehiste, 1970; Lieberman, 1967). Abe (1980) points out that the pitch contour in speech provides cues that are biological, physical, affective, grammatical, and phonological. In a lengthy presentation on intonational meaning in fluent speech, Ladd (1980) provides numerous examples for the importance of pitch contours in the perception and apprehension of the sense and meaning of phrases and sentences.

Pauses within the rhythmic structure of sentences serve to establish phrase boundaries and set up listener expectations for certain types or functions of words (Chomsky, 1971). The rhythmic organization of a sentence assists the listener in processing both its syntactic and its semantic structure. Variations in intensity and relative intonation in the presentation of different words and syllables in a sentence also have a significant impact on how its underlying meaning is understood (Freund, 1975).

Clearly, sentence perception and processing have a critical dependency on the prosodic cues provided in fluent speech. When placed in song, however, many of the prosodic cues present in spoken language are often obscured or even eliminated. The various inflections and contours injected into speech are superseded in song by musical parameters such as tempo, rhythm, intonation and accent. The primary normalizing features which enable the listener to perceive syntactic boundaries, to select correct lexical items, and to develop semantic expectations are subject to interference once language is placed in a musical context.

With the prosody of the language minimized and word intelligibility potentially lowered, the need to maximize other aids to word recognition and sentence intelligibility becomes paramount. At the same time, it is also necessary to work for text intelligibility while still maintaining an aesthetically pleasing musical performance. An effective choral diction method must be founded on a set of principles that are aimed at training the choral singer to develop and habituate new phonological rules that are appropriate to choral performance. Furthermore, this set of principles must be governed by essential components of choral music performance (i.e., blend, balance, intonation, rhythmic precision, etc.). Although the principles listed below are intended specifically for an English diction method, many of the principles will apply to other languages as well.

Principles for the Development of a Systematic English Diction Method for Choral Performance

Principle 1: Word intelligibility depends to some extent on the phonemically accurate production and perception of speech sounds.

Principle 2: Vowel and consonant sounds are better understood when perceived in combination. In choral singing it is necessary, therefore, to clearly articulate both vowel and consonant sounds whenever possible and feasible.

Principle 3: Contextual information which aids the listener in speech perception by reducing the number of possible choices for otherwise unintelligible words does not exist in choral performance beyond the scope of a title and, perhaps, program notes. It is necessary, therefore, to maximize other aids to the intelligibility of text in choral performance.

Principle 4: The syntax and semantics of common speech are often altered or distorted through poetic form and musical parameters (e.g., held notes, broken phrases, accents, tempo changes, strict meter). Since syntax and semantics are important aids in the perception of speech, these types of alterations and distortions can interfere with text intelligibility. It is necessary, therefore, to maximize other aids to the perception of words and sentences to assure intelligibility of choral text.

Principle 5: The prosodic features found in fluent speech which aid the listener in normalizing and processing the surface and deep structures of sentences are generally superseded by musical parameters when language is placed in song. It is necessary, therefore, to maximize other aids to the perception of words and sentences to assure intelligibility.

Principle 6: Phonetically pure vowel sounds enhance the aesthetic appeal of choral music (Ehmann, 1968; Garretson, 1981; Heffernan, 1982; Lamb, 1974; Roe, 1983).

Principle 7: Support and enhancement of ensemble characteristics in choral performance enhances the aesthetic appeal of the presentation.

Principle 8: Coarticulation is a natural and necessary operation in speech production. The continuous coarticulatory vowel transitions found in spoken language, however, are functionally impractical and aesthetically unacceptable in sung language where tempos fall below those of fluent speech. To avoid the perturbations to choral tone that result from vowel alteration, nasalization, and gradual diphthong transition, and to enhance ensemble performance qualities, it is necessary to assign coarticulatory operations to finite points within the choral presentation.

Principle 9: Consonant assimilation is an economizing phenomenon in fluent speech. Although the perceiver is often able to normalize assimilated consonants, clear articulation, when feasible, is preferable since the articulatory target is the ideal speech sound. To maintain ensemble articulation of consonants, it is necessary to assign consonant articulation to finite points within the choral presentation.

Principle 10: The most functional finite point in music is a rhythmic designation. The articulation and coarticulation of sounds should be assigned to rhythmic locations within the pulse.

Principle 11: Assimilation is a function of coarticulation which is a function of articulator movement. Control over coarticulatory operations, therefore, depends on articulator awareness and control.

Principle 12: Articulator position dictates the acoustical reality of speech sounds. Diction methodology in choral performance must therefore rely upon articulator awareness and control.

Principle 13: The processes inherent to fluent speech which perturbate vocal/choral performance are often habitual and involve subtle physiological movements. A choral diction method must, therefore, concentrate on the development of kinesthetic awareness and control rather than on acoustic information.

Principle 14: Fluent speech contains characteristic cues and parameters that are absent from sung speech (e.g., phonological intonation vis-a-vis musical intonation, phonological rhythm vis-a-vis musical rhythm, phonological stress vis-a-vis musical stress, etc.). One can conclude, therefore, that the phonological rules acceptable to spoken language are not necessarily acceptable for sung language. Just as there is a phonology for spoken English, there must be a phonology that is appropriate for sung English that must be practiced and habituated.

Principle 15: A methodology for training singers in the effective production of English diction in choral performance should include the following characteristics:

(a) Students must be guided to an awareness of the operations that are found in fluent speech that have the potential to hamper vocal/choral performance.

(b) Exercises must be carried out within a given pulse and utilizing rhythmic units as temporal guides for articulation in order that ensemble precision and unity will be facilitated.

(c) Exercises in diction development must concentrate on the development of kinesthetic awareness and control rather than on acoustic information.

(d) Exercises must be graded, beginning with articulatory target exercises for pure phonetic production, followed by C-V and V-C exercises that concentrate on awareness and control of articulators as the transition from one target to another transpires. Exercises should progress further to individual words, word pairs, and finally to word phrases.

(e) Exercises must include contexts where assimilation generally occurs in fluent speech, encouraging articular awareness and control in achieving the articulatory targets.

(f) Achieving an appropriate and consistent choral phonology depends upon the habituation of method and transfer to choral selections actually begin performed by the ensemble. Exercises should also include some contexts from selections being rehearsed.

Conclusion

By employing the set of principles outlined above, it should be possible to design, develop, and implement a choral diction method that serves the ends of choral tone and text intelligibility. Moreover, such a diction method would be consistent with the conclusions drawn from extensive research in the fields of phonology, physiology, and acoustics.

A widely shared diction model could serve to improve the continuity of choral music education, increase the effectiveness of clinic and festival situations, and provide a standard by which a choral ensemble's performance could be evaluated. Moreover, a choral diction method that is based upon research in phonology, physiology, and other research areas should provide a foundation for a consensus on issues surrounding the "proper" or "appropriate" approach to diction in choral singing.

Appendix

International Phonetic Alphabet Symbols Used in the Text and Their English Language Equivalents

IPA SYMBOL	ENGLISH EQUIVALENT
(Vowels)	
i	f<u>ee</u>t
ɪ	f<u>i</u>t
ɛ	b<u>e</u>t
æ	c<u>a</u>t
ɑ	f<u>a</u>ther
ə	<u>a</u>bove
(Consonants)	
ŋ	so<u>ng</u>
ʤ	<u>j</u>ustice
ʃ	<u>sh</u>aring

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